

The Endeavour Project: Explorations in Hypermedia

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This paper serves to introduce the Endeavour Project, a collaborative research venture between the Centre for Cross-Cultural Research, at the Australian National University, and the Australian National Library. Other participants in aspects of the project include the State Library of New South Wales, and the Australian Literary Editions Program of the Australian Defence Forces Academy.

Essentially, the project has two major goals. The first is to exploit the potential of networked digital media to open new lines of research into the course and cultural impact of James Cook's momentous first Pacific voyage aboard the bark Endeavour (1768-1771). We will be using hypermedia to analyse and explicate the wealth of texts, images and Oceanic cultural artefacts that comprise the legacy of the Endeavour voyage. In particular, we are concerned to produce new insights into cross-cultural interactions between Europeans and the indigenous peoples of Australia and Oceania in the second half of the long eighteenth-century (from 1760 to the mid-1830).

The second dimension to the project has a more technical focus that we hope will result in outcomes of generic use to researchers, educators and librarians in the humanities. It involves the development over the next three years of scholarly editing standards for historical documents such as the journals kept by Cook and Joseph Banks during the course of the Endeavour voyage. Also, we plan to produce software to facilitate the automated migration of digital resources and metadata to, and from, regional, national and international digital libraries. As we explain in a little more depth later in this paper, it is vital that historians develop processes to create scholarly digital editions, and moreover, 'add value' such as automated hyperlinking, indexes, tables of contents and so on. For reasons that are also discussed towards the close of this paper, these editorial resources will be created using 'open-source' software programs.

Perhaps it was inevitable that one of the first hypermedia projects in the field of Pacific history should be focused on James Cook's first voyage of discovery of 1768-1771. The Endeavour voyage has always been central to our imagining the history of European

exploration, settlement and colonial ambition in the Pacific. Cook's achievements and the consequences of his voyaging remain subjects of compelling interest for the peoples of Australia, Aotearoa / New Zealand and many of the island nations of Oceania. Indeed, the words of George Forster, one of several leading Enlightenment naturalists who sailed with Cook, today seem remarkably prescient. Cook's voyaging, Forster wrote, would 'strike deep roots and...long have the most decisive influence on the activity of men.'

The intellectual core of the project involves the production of hypermedia editions of the key narratives written during and immediately after Cook's Endeavour voyage. These include Cook's own journal of the voyage, the journal of Joseph Banks, and the first published account of the voyage, prepared by John Hawkesworth, which appeared in 1773.

The prospect of Cook's journal being freely available through the internet has already generated widespread popular interest in Australia. However, we are concerned to ensure that its reception does not re-inscribe the romance of European Pacific exploration. Rather, we hope to draw upon new research by the project team and leading 'post-colonial' historians, amongst whom pre-eminence must be accorded to Bernard Smith (1960, 1992) and Greg Dening (1980). Our concern will be to contextualise and re-appraise the historical significance of the Endeavour narratives, through comparing and contrasting them with the wealth of historically related texts, images, objects and ideas that comprise the legacy of the voyage. By hypermedia interrelation of these records of voyaging and cross-cultural encounter we hope to illuminate the fluid, complex and often highly localised play of diverse cultural and material factors that shaped relations between European voyagers and Oceanic peoples in the mid-decades of the eighteenth-century. We are particularly concerned to explore how meetings across cultures were understood by those involved, and how they consequently influenced the histories of Europe and the societies of the Pacific in obvious and many subtle ways.

There is a compelling case for historians producing research outcomes in electronic media simply on economic grounds. The past half-century has seen phenomenal growth in the number and size of universities in both the west and the world's developing nations. The resulting increase in the volume of research activity and scholarly publication has commonly been characterised as a knowledge explosion. At the same time, the costs of production and consumption of this increasing wealth of information have steadily increased. For example, in 1999, the cost of scientific serials in the United States was 11 percent higher than they were the previous year, and 54% higher than they were in 1995 (Buckholtz, 1999). All but the most richly endowed research libraries have needed to implement cost-cutting strategies. These have generally taken the form of cancelling subscriptions to print

runs of specialist journals, while seeking to provide researchers with access to their content either through networked document delivery systems or, where they exist, to electronic editions of journals.

While provision of networked access to scholarly journals has reduced library acquisition and management costs, often savings have had to be found in the context of reduced operating budgets. Consequently, it has been impossible for the majority of libraries to rationalise expenditure on serials without reducing monograph purchases in the humanities and social sciences.

Worsening the situation for historians, over the past half-century specialist monographs and editions of source documents have rarely been published by other than university presses. Production and marketing costs have always been high. As knowledge has become more extensive and specialised, academic publishers have found it difficult if not impossible to find economies. Since the mid-1990s, they have come to account for above 80 percent of the overall costs borne by university publishers (Mandel and Summerfield, 1997). Even when presses are able to subsidise the production of specialised historical texts by more popular works, print-runs are small. Books necessarily must be sold at prices which interested researchers cannot afford, let alone non-academic readers. So, while there is now arguably more high quality historical research being produced than at any previous time in the history of higher education, the prospects that it will appear in print have never been so bleak.

One solution to the problem increasingly being discussed by professional historians is the publication of electronic monographs. Robert Darnton, French Enlightenment scholar and President of the American Historical Association, has been instrumental in encouraging the Association to explore the feasibility of producing specialised historical studies in electronic form (Darnton, 1999). Given that printing and marketing account for by far the greater part of the costs incurred in producing the kinds of monographs written by university based historians, electronic editions should substantially reduce costs to publishers, libraries and individual readers.

Darnton is a historian much admired for the literary artistry with which he has generated new insights into the cultural meanings of books and reading in late eighteenth century European culture. It comes as little surprise, then, that he should see digital historical monographs as having the potential to be much more than electronic copies of what, in better times, might have appeared in print. They might meet the same needs and expectations that books have traditionally met, but they might do much else besides.

The evolution of sophisticated and inexpensive software has made it possible to represent and inter-relate historical evidence in new and remarkable ways. It is now possible for historians to create new kinds of artefacts, in which historical explanation and argument take forms that allow readers to explore in greater depth the evidence on which the claims of the author rest.

Alert to this, Darnton suggests that a digital history ‘book’ could be a carefully structured assemblage of information resources, in which the reader is presented with the major findings of a research project by way of a relatively concise and engaging narrative. Where this narrative might differ from a conventional book is in introducing various layers of more detailed information. If they wished, readers could move from the narrative to read essays that deal in greater depth with specific issues raised in the course of the work. They might be presented with alternative ways of interpreting the evidence on which arguments advanced rest. Indeed, they might be given substantial portions of the evidence itself, together with ways of using this material to generate new perspectives or fresh questions. The work might, for example, incorporate teaching and learning resources. It could even incorporate critical reactions to the work, its conclusions and content contributed by other researchers.

However, creating the kind of flexible digital resources by which this might be done poses major conceptual and technical challenges. As to the nature of these challenges, Darnton’s own recent books and essays help illustrate the problem. He vividly reconstructs the past with imagination and literary flair, but we would do well to note that he is able to engage the reader's imagination so vividly because he writes with an informed sense of working within tradition. He understands the conventions and rules by which history has been written in Europe since the early modern era, and how those rules might be questioned or reinterpreted to bring hitherto overlooked aspects of the past to light.

In the digital realm, scholars of history and related disciplines currently have few well-articulated and commonly accepted conventions or rules. At a more structural level, there are as yet few, if any, of the kinds of editorial conventions and standards which, in the world of print, have slowly evolved since the late fifteenth century for sustaining historical exposition and narrative. Until we have shared rules of conversation in the virtual realm we will remain severely limited in how far we can engage in the kinds of experiment and evolution necessary for making sense of the past.

Our thinking on this score has been reinforced by our respective experiences in

building web-based teaching and learning resources through the mid-1990s. Blackall has played a key role in the evolution of distance education infrastructure within the Australian higher education sector. Turnbull has pioneered the use of networked communication amongst professional historians in Australia, especially through his work with H-Net, the international On-Line Network for the Humanities and Social Sciences, and various web-based projects. In building virtual teaching and learning resources, both have discovered how time-consuming and expensive they can be, especially during the pre-production phase of locating relevant textual and visual materials, gaining copyright clearance for internet use, and then proceeding to create digital copies.

Invariably, Turnbull found himself working with limited funds that were largely expended on the translation of materials into digital forms. What was left went on ensuring that the information architecture of the resulting web-sites were best suited to their educational goals. By the time he was ready to start evaluating the worth of what had been created - by having students use the materials in one or more courses - budgets were exhausted. When evaluation revealed pedagogic shortcomings, he and his collaborators were severely limited in how far they could redesign to overcome their failings.

What Turnbull also found was that though the resources he created were made freely available through the internet, or could be provided on CD for the cost of copying the disk and postage, they were rarely used by colleagues and students in other Australian universities. In the case of one particular web-site, students were invited to explore the interrelationships between statistical reasoning and racial thought in nineteenth-century Britain and the Australian colonies (Turnbull, 1997). It was gratifying to find that the site was used regularly within a number of North American and British universities. Indeed, tantalising possibilities for further collaboration were raised, notably in the case of a British researcher interested in encouraging students to explore the historical antecedents of modern day methods of criminal identification. However, in Australia the site was rarely used - even by colleagues preparing related web-based resources on similar or related themes.

Why was this? On investigation it became clear that there were a number of reasons. One factor inhibiting colleagues from recommending the site was that it incorporated several interactive exercises built with a very successful form of proprietary software, which required the use of a browser 'plug in'. The problem was that few students had their own computers, let alone access to an internet service provider; and the number of machines available on campus which could cope with the software we had employed fell far short of student demand. This raised a serious question of equity of access which colleagues were

probably right to address by not including the site in their curricula. But what was by far the most significant reason was that they were loathe to exploit the resource because they felt unable to place the same degree of trust in the site that they were accustomed to giving print-based copies of the same texts and images.

On reflection, colleagues were right to be suspicious of the integrity of the materials provided. Every effort had been made to ensure that what was offered by way of primary sources, interpretation and exposition was accurate and suitably reflected received opinion amongst leading scholars. However, where the exercise failed was in ensuring that the extracts of historical documents we produced conformed to conventional editorial standards. Likewise, the historical images and pictures of objects offered came without detailed information as to the provenance of the original items from which they had been reproduced. Colleagues with similar interests preferred the time and expense of starting from scratch, to the extent of securing texts and images through inter library loans.

Our goal then is to ensure that the outcomes of the Endeavour Project will not suffer a similar, more costly fate. Much of our thinking in this early phase of the project has been focused on creating the necessary conditions for historical discourse in the digital realm.

In this regard we are not exactly heading into an uncharted ocean. At a theoretical level, there is a growing body of research, including several important studies of the history of trust, testimony and judgement in academic practice (Shapin, 1994). Much of this work elucidates the social conditions in which peer review has been exercised, and draws attention to how the communal processes of judgement are bounded by interpretative conventions. This work also challenges us to think about what criteria we should adopt to assess the worth or otherwise of work in digital media. Do we merely aim to translate the established criteria that have governed print-based scholarly discourse into the networked environment, or does working in digital media demand the evolution of new measures for assessing intellectual worth? Recently, for example, a number of H-Net staff participated in the evolution of criteria for awarding professional recognition to outstanding web-sites. In some respects the criteria seemed obvious. Yet questions arose as whether we needed to take on board criteria such as 'usability', 'extensibility', 'interoperability' to name but three concepts which are still foreign to most colleagues who routinely assess the worth of what their colleagues and students say. There was even some discussion of whether to consider the aesthetics of web-sites.

In the future, we may find ourselves integrating new criteria that reflect the conceptual peculiarities of the digital realm. But it makes little sense to do so without also

seeking to preserve the conventions governing the practice of history we have refined over centuries through print based discourse, and which, intellectually and morally, continue to serve us well. And this means focusing our energies, at least in the immediate future, on ensuring that we develop stable and robust standards to underpin and facilitate scholarly interaction in the digital realm.

In the digital environment, tasks of annotation, reference and commentary are very different processes to those undertaken in print. For one thing the cultural artefacts which are the object of scholarly explication are separate and distinct objects. They need to be related in ways that ensure the relationships posited are not erased by mundane machine-level changes to the information infrastructure in which they reside. Complicating the problem is that digital referencing is likely to involve the linking of information sources that may be physically located on many different networked sites.

Moreover, one suspects that a number of the increasing number of historians currently exploring the potential of networked digital media in teaching and research would question whether the kind of artifact Robert Darnton envisages is still too closely wedded, conceptually speaking, to the form and functions of the book. It may be that video, or the more sophisticated computer-games that capture the imaginations of younger generations, offer what in the future will be different and quite likely more effective styles of communication. Also, many historians, especially in fields such as postcolonial history are concerned to explore issues of cross-cultural and interpersonal difference. Should they seek to do this in the virtual realm they are bound to create complex assemblages of text, sound and visual sources that elucidate the ways in which different cultures have used differing modes of communication to know the past in all its richness and complexity.

Hence the value of exploring the rich legacy of Cook's first voyage in hypermedia is not only that it promises to generate new historical insights, but that it also provides an ideal 'test-bed' to explore the opportunities and possibly the limitations of digital environment.

Much of the cultural salience of Cook's first expedition derives from the wealth of its visual record. Working with these images we will need to ensure that they are reproduced in sufficient resolution and with a degree chromatic integrity that allows them to be subjected to close scrutiny and explication. Compared to text, the reading of images using the kinds of visual display units which educational institutions, libraries and private users can currently afford raises a number of nice technical problems. Ideally, we will need to provide images in forms that allow readers to move easily, from viewing what are often extremely complex works of the engraver's art in their entirety, to examining detailed, and

often near microscopic, aspects of its composition.

This is a particularly important consideration in respect of the engravings prepared for inclusion in published accounts of eighteenth century voyaging. These plates, or cuts as they were called at the time, often relate to textual descriptions of geographical discovery and encounters with non-European peoples in interesting and complex ways. As recent work by Nicholas Thomas (1995) and Bronwen Douglas (1999) has shown, these images were highly detailed visual representations of key moments during Cook's voyaging. But often they were visual supplements, which, from the point of view of the historian, offer much additional information, or visual clues, about encounters with foreign landscapes and peoples which the written records they relate to treat in a glancing or ambiguous fashion. We will consequently need to devise ways of analysing and explaining these relationships, so as to ensure that our digital Endeavour texts and images can be used by other researchers, who similarly want to generate new analyses and interpretations.

The Endeavour project, then, brings together historians, researchers interested in the infrastructure and policy implications of scholarly digital knowledge networks, and librarians charged with developing functionality and standards for digital libraries. Much of our focus will be on investigating and hopefully providing solutions in key areas of concern regarding the production of scholarly digital editions and their migration to, and long-term storage in, digital library environments.

At this very early stage of the project, a key consideration is to develop tools that will streamline the tasks involved in preparing resources and associated metadata. What we develop must be easy to use in initially translating materials into the digital environment. They must allow researchers to take materials already in digital forms and add intellectual value to them, by providing more finely grained indexing or relating them to specialist annotations or commentaries. Unless they do, they will be of little value to interested scholarly communities. So, a good deal of our time and energy in the first year or so of the project will be devoted to gaining a clear understanding of end-user requirements of scholarly digital editions and their potential interaction patterns with other types of printed and hypermedia-based scholarly genres.

Our project will draw heavily on the foundational research and development undertaken by the text encoding initiative (TEI). We will also be working closely with library communities using the Electronic Archival description (EAD) We also anticipate learning much from several current projects focused on the creation of historical editions using more finely revised document type descriptions. In particular, the project team plan to work closely with personnel of the State Library of New South Wales, who are currently

working on the encoding of the journals of Matthew Flinders, who navigated and explored the Australian coast at the beginning of the nineteenth-century.

So far our conversations with the State Library have focused on the desirability of ensuring that our respective editions of the Flinders and Endeavour journals adhere as far as is practicable to shared encoding and metadata schema. What makes it all the more logical for us to do so is that our respective projects are working with the same kinds of documents and images: voyaging journals, scientific illustrations. Between us we have the perfect test materials to explore the development of mechanisms for allowing users to compare and contrast how these resources deal with common themes in the history of Australian exploration and settlement.

From the point of view of scholars and librarians, archival stability is of critical importance. During the first year or so of the project we will be investigating and implementing ‘best practices’ in digital archiving and automated mechanisms to assist users of the publishing and collection management systems to migrate their collections in ways that ensure their archival stability. In regard to the particular expectations of the historical community, it is reasonable for them to expect that digital editions of texts and visual materials should be accessible on wide range of systems.

Traditionally, authors and publishers have added ‘value’ to their core scholarly content through widely accepted publishing conventions, such as endnotes, indexes and concordances. In the case of digital editions of historical documents, content enhancement or ‘value added publishing’ (Berghel, 1999), involves the enrichment of the semantic or syntactic content of a document. The enhancement of semantic content can be understood as the attempt to create more meaning in relation to documents through annotations, commentaries and interpretative essays. In the hypermedia environment this largely but not exclusively involves such things as the creation of mechanisms for the automated inclusion of stable hyperlinks. The enhancement of syntactic (i.e. grammatical, tag-based) content, on the other hand, is more challenging, in that it affects the ways documents are structured, indexed, taxonomized and linked within the intervening network and computer resources. An example of enhancing syntactic content would be adding structure to documents for the benefit of helper agents, search engines, indexing tools, data mining, and warehousing applications.

Our thinking on these issues is still at a very preliminary stage, and the future looks quite daunting in some respects. To take one concrete problem: as Greg Denning has brilliantly illustrated, the eighteenth century expeditionary vessel was a contained world.

Yet it was a world in which a multiplicity of languages were spoken. There was the common diction of navigation vital to safe voyaging, and the formal utterances of discipline and command. There was also the measured and polite discourse of the captain's table, and the argot of seamen, a lingua franca that served to affirm the customs and hierarchies shared below deck by men whose dialects reflected their origins in many parts of the British Isles and its colonies. To complicate matters further, the Endeavour voyage brought this world of linguistic diversity into conversation with peoples whose patterns of communication were equally shaped by diverse cultural forces. Europeans and indigenous peoples sought to translate each other's meanings through attempting to determine points of affinity and difference. They parted linguistically richer perhaps, though certainly changed by the encounter. Clearly any attempt to facilitate virtual reconstruction and assessment of these cross-cultural conversations must be underpinned by automated means of indexing and searching.

This kind of value adding could be done using non-automated means, although the cost of labour and the need to ensure data quality dictates that value added services should be automated wherever possible. For example, many elements of a metadata record can be automatically compiled, based on system states or user log-on information. Similarly, the complex tasks of maintaining hyperlinks or collections of digital objects should be handled as far as possible by automation.

Web-centred content management and publishing systems are becoming more common, but the higher capacity commercial systems tend to be very expensive, and difficult to maintain without costly technical support. In order to address this gap in the educational market for economic user-friendly systems, the Endeavour project will involve the construction of a system based on open source programming. The design of the system will support the specific content management needs of the project in the first instance. However, it will be designed using open architecture and standards so that it can be adapted for use in similar projects and applications. As recently observed by Michael Jensen, of the US National Academy Press, our goal in universities and academic publishing is to create value for society. We need to take advantage of our commitment to shared knowledge and capacity for research collaboration to make the most of the limited resources we have (Jensen, 1999).

Finally, it is perhaps worth stressing that the Endeavour Project is not about replacing books with web-based resources. Rather, it is an exploration of the challenges and opportunities presented by the growing feasibility of 'multivalent' or 'hybrid' publishing. Though the project is largely focused on the production of networked hypermedia resources,

we see print-based publication as central to scholarly activity and likely to remain so. Consequently, we plan to make versions of the digital editions that form the core of the project available in high quality print-based formats. In all likelihood this will entail the exploring the use of XML to store ‘source’ files and ‘dynamically’ generate editions using XSLT (particularly in PDF) for the emerging ‘print-on-demand’ market.

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